

Mission Task Analysis for the NATO Defence Requirements Review

Stuart Armstrong

QinetiQ

Cody Technology Park, Lanchester Building

Ively Road, Farnborough

Hampshire, GU14 0LX

United Kingdom.

Email: SAARMSTRONG@QINETIQ.COM

This paper gives a general outline of the NATO Defence Requirements Review (DRR) and how mission analysis has been used to provide a consistent and detailed approach to the decomposition of complex military missions. The Mission Task Analysis methodology is described and illustrated with two examples using generic planning situations (a Peace Support Operation and a Article V operation.)

Introduction

The primary challenge for NATO Defence Planning is to maintain the military means for all missions; from Peace Support Operations to Collective Defence (Article V). To meet this challenge a balance needs to be struck between: high readiness deployable forces for collective defence and crisis response; and lower readiness forces for collective defence and rotation, longer term build-up and augmentation.

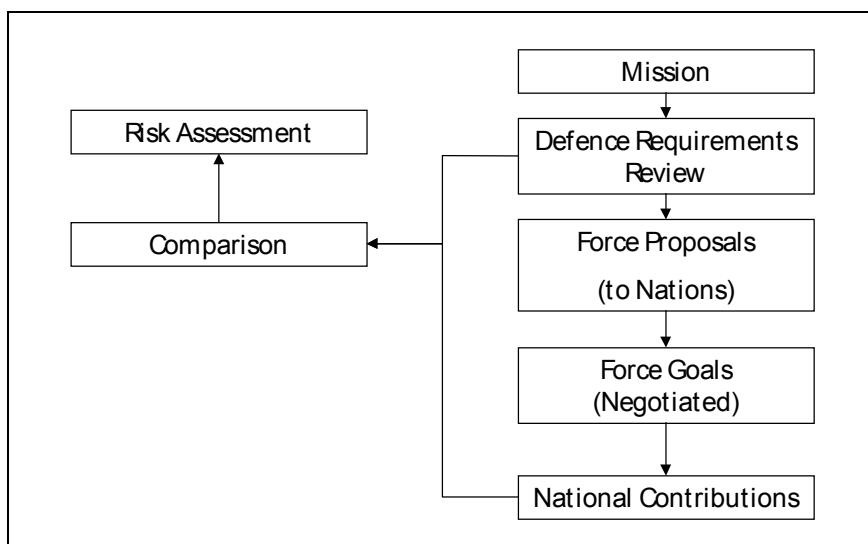
NATO defence planning covers the following principal planning disciplines:

- i) Logistics Planning
- ii) CIS Planning
- iii) Nuclear Planning
- iv) Civil Emergency Planning
- v) Resources Planning
- vi) Armament Planning
- vii) Force Planning

This paper details the process followed by NATO in conducting force planning, in particular it details the Defence Requirements Review and the methodology developed.

Defence Requirements Review

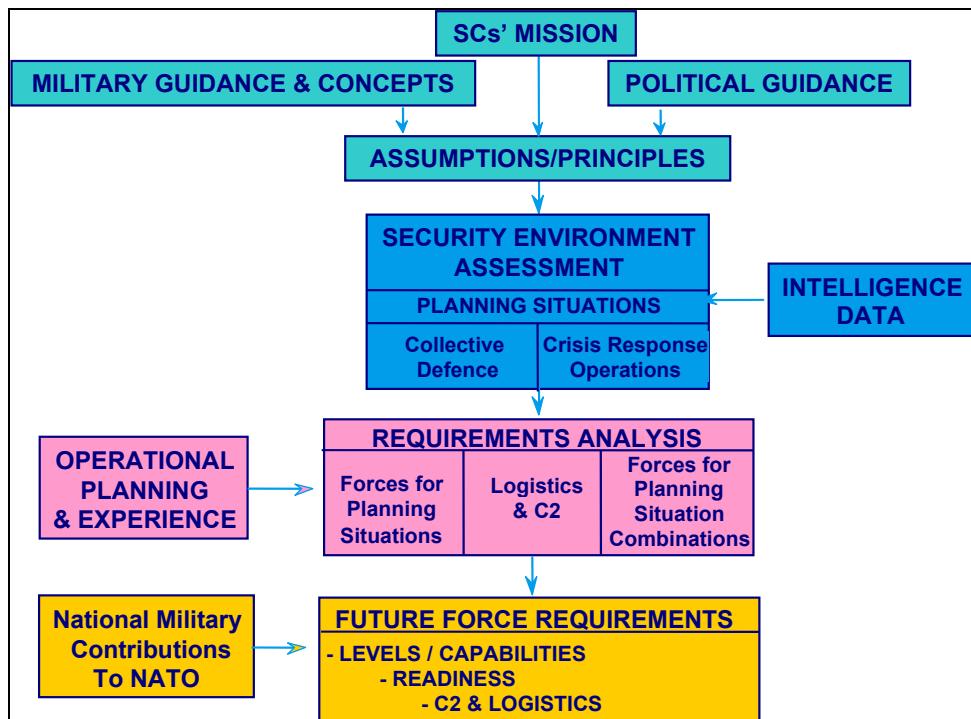
The Defence Requirements Review (DRR) is one step in the Force planning process:



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The DRR is developed directly from the mission statement(s) and details the required capability necessary to fulfil the stated mission. Once the DRR process is complete, the requirements are proposed to the member nations and force goals negotiated. Each of the member Nations responds with its national contribution and a comparison is made with the requirements, followed by a risk assessment if the national contributions do not match the requirements.

The DRR itself follows a number of steps, from top level strategic command missions through security assessment reviews, to the analysis of the requirements and estimation of the future force requirements. The process is shown in the following figure:



The remainder of this paper focuses on the method used for determining the force requirements for each planning situation.

Mission Task Analysis Methodology

This methodology was originally developed by the Operations Research Division of the NATO C3 Agency and involves an analytical method that identifies the joint mission tasks and associated force allocation rules.

The task decomposition approach attempts to identify all required and implied tasks for an operation. The current structure is a hierarchy with components as follows:

- Mandate
- Mission Essential Components
- Operational Objectives
- Operational Objective Specifications
- Key Tasks
- Joint Activity Trees
- Force Allocation Rules

Where each level in the hierarchy has a specific definition:

- 1) **Mandate** – The political purpose for the use of military force. The political/military mission.
- 2) **Mission Essential Components (MEC)** – MECs are high level essential military tasks and includes all mandated and implied tasks. Failure of a MEC implies likely failure of the mission. The MEC are the highest level complete set of required tasks.

Both the Mandate and MECs are high level (i.e. strategic), global (i.e. not time dependent) statements which are not dependent on a chosen course of action. To decompose the mission into the lower elements a **course of action** needs to be chosen. The course of action details how the MEC are to be achieved in time.

- 3) **Operational Objectives (OO)** – Operational Objectives are the temporal decomposition of the Mission Essential Components into higher level operational level tasks. Changes in the set of Operational Objectives will define **Phases** for the mission.
- 4) **Operational Objective Specifications (OOS)** – Specifications are an amplification of an Operational Objective within a phase.
- 5) **Key Tasks (KT)** – Key Tasks are related to the physical means by which the force can successfully accomplish the Operational Objective (or OOS). Key tasks represent the lowest level of non-service specific, required tasks.

Each key task represents a separate low-level problem which can be analysed and forces (both numbers and types) associated with. The final two levels of the decomposition contain the analysis and assumptions for each of the key tasks:

- 6) **Joint Activity Trees (JAT)** - A JAT is a description of the low-level tasks or activities. Each JAT represents joint tactical solutions to the “problems” posed by key tasks.
- 7) **Force Allocation Rules** - The force allocation rules detail the logic behind associating forces to JAT task requirements, including assumptions and timings.

By comparing timings of certain JATs within the mission it is easy to see where forces assigned to complete one particular activity can be re-used for sequential tasks.

Mission Task Analysis Examples you call it Mission Task Analysis methodology in the previous section, please decide which is the best description

The above methodology has been successfully applied across a wide range of situations (including both Peace Support Operations and Mutual Defence). To illustrate the methodology two examples are given here: Peace Enforcement and Collective Defence (Article V). It should be noted that the two examples are not complete task decompositions.

Example 1: Peace Enforcement to Restore Order

Mandate – “The force is to provide sufficient security within the region to allow political and diplomatic activity to occur which could lead to the establishment of a recognised civil authority.”

Mission Essential Components – In support of the above mandate:

- i) Provide a secure environment by establishing the military dominance of the Peace Force.
- ii) Assure continued and uninterrupted provision of essential services and the protection of strategic national assets.
- iii) Assist in the protection of civilian agencies in restoring the economic infrastructure and the provision of aid.
- iv) Deter, and if necessary prevent, adverse external intervention.
- v) Ensure continued political support for the mission.
- vi) Conduct operations in accordance with the principles of PSO.
- vii) Provide Standard Military Requirements.

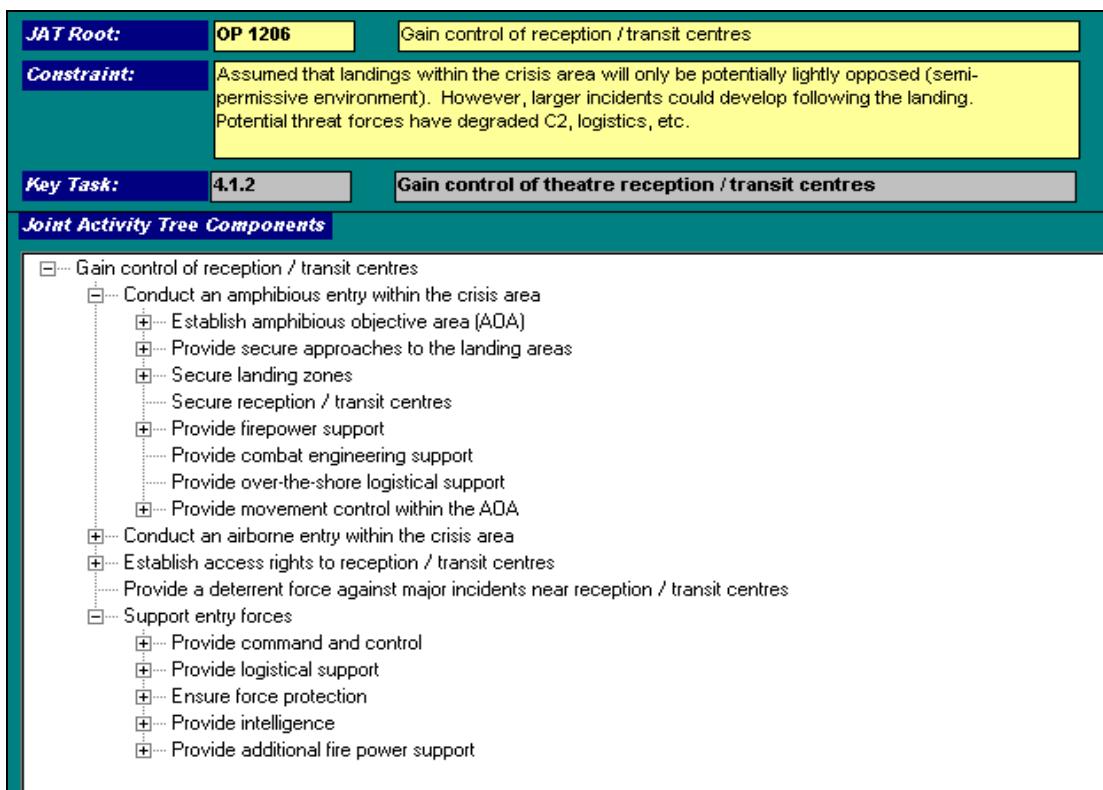
Operational Objectives – in support of MEC (iv) “Conduct enabling operations for own force”

Operational Objective Specifications – in support of the above OO “Ensure Safe and timely arrival of forces”

Key Tasks – In support of the above OOS:

- i) Transport forces to theatre
- ii) Gain control of theatre reception/transit centres
- iii) Extend reception/transit centre capacities
- iv) Operate theatre reception/transit centres
- v) Ensure security of reception/transit centres

Joint Activity Trees – In support of the second key task:



Force Allocation Rules – Contains rules and assumptions for the above JAT:

JAT	OP 1206	Gain control of reception / transit centres
Force Allocation Rule		Entry area = suitable APOD + SPOD + Assembly area in close proximity Entry designated as amphibious or airborne - generally only first entry area is designated amphibious Requirements - Amphibious Entry / per entry area Surveillance Taskings - ASW area, ASW barrier, AGSR of entry area, Weather conditions, Manoeuvre forces - 2 marine infantry battalions, 2 tank platoons Firepower support - minimum of 1 artillery battery / battalion, 1 CAP (2 a/c) [DCP of force = DCP of potential threat] Military Engineering support - normal combat support level
Input		Location of entry area Potential threats in vicinity Selection of amphibious / airborne Day by which entry area is to be secured
Output		Manoeuvre and combat support forces Surveillance taskings Force protection taskings
Timing		D-Day (entry of airborne or amphibious forces) = day entry area to be secured - 5 days MCM clearance for amphibious landing area by D-Day ASW area surveillance completed before MCM clearance commences
Tools		None
Notes		Assumptions: APOD, SPOD, assembly areas and lines of communication have suffered minimal damage.

Example 2: Collective Defence – Article V

Mandate – “Establish sufficient military forces, within the theatre of operations, to prevent sustained violation of NATO territorial integrity. Prevention should take the form of deterrence, defence and, if necessary, restoration operations.”

Mission Essential Components – In support of the above mandate:

- i) Prevent Violation of NATO territorial integrity.
- ii) Maintain Alliance Solidarity & Cohesion.
- iii) Standard Military Requirements.

Operational Objectives – In support of MEC (i)

- i) Conduct Deterrence Operations
- ii) Conduct Defensive Operations
- iii) Conduct Restoration Operations

Operational Objective Specifications – In support of OO (i)

- i) Show of Force
- ii) Defend Vital Locations
- iii) Enforce Sanctions
- iv) Provide a Defensive Deterrence

Key Tasks – In support of OOS (iv)

- i) Provide a deterrent force for threats
- ii) Deter Interference from third parties

Conclusion

The methodology detailed above provides a consistent approach for the decomposition of complex military missions. The methodology has demonstrated its suitability across the range of military missions and has been successfully applied to: Peace Enforcement, Conflict Prevention, Extraction, Peace Keeping and Article V.

As well as providing the basis for determining force requirements the methodology also provides self-documentation of the planning situations and a “scenario framework” for supporting other work.



Mission Task Analysis

For the NATO Defence Requirements Review

Contents

- Introduction
- NATO Defence Planning
- Mission Task Analysis Method
- PSO Example
- Article V Example
- Conclusion

Introduction - QinetiQ

- Formed in July 2001
- QinetiQ comprises the greater part of DERA, the British Government's "Defence Evaluation and Research Agency"
- Incorporates the bulk of the MoD's non-nuclear research, technology and test and evaluation establishments.
- QinetiQ is currently a wholly government-owned UK plc.

Operations Research Division

- Part of NATO C3 Agency
- Responsibility to provide support to the strategic commands for both operational and defence planning.
 - Includes both support to Article V Operations and Crisis Response Operations
- NC3A has developed an analytical method that involves the identification of joint mission tasks and associated allocation rules.
- This method has successfully been applied to three Defence Requirement Reviews.

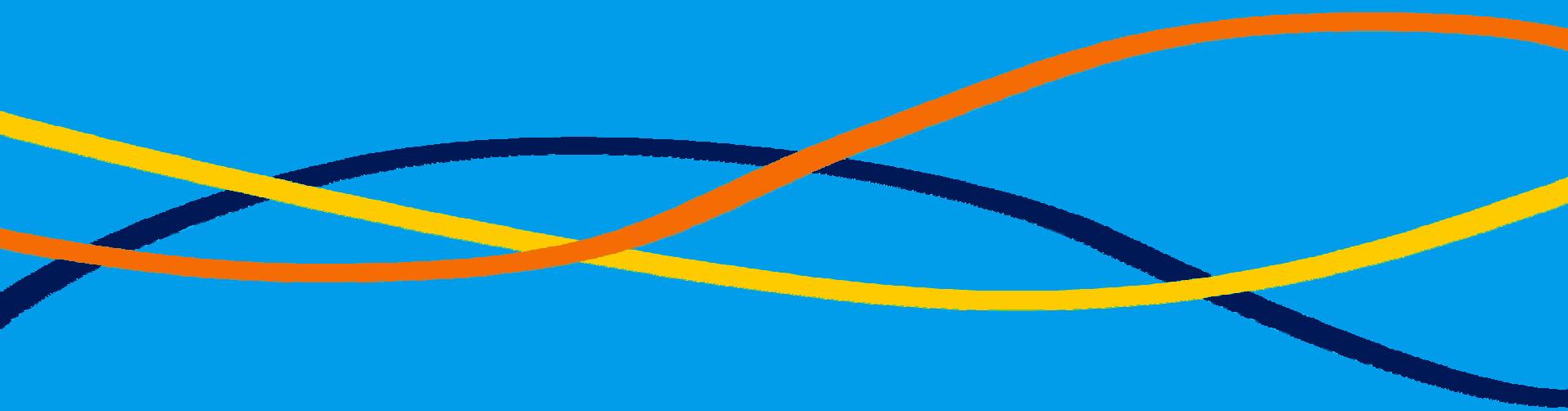
New Alliance's Strategic Concept

- New Alliance's Strategic Concept
 - Developed during Washington Summit 1999
 - Update of 1991's Strategic Concept
 - Redefines fundamental security tasks taking into account:
 - evolving security environment .
 - new command structures.

New Alliance's Strategic Concept

- NATO's Fundamental Tasks are:
 - Security
 - Consultation
 - Deterrence & Defence
 - Crisis Management
 - Partnership

Defence Planning



Challenge for Defence Planning

- Maintain
 - the military means for all missions
- Balance
 - high readiness deployable forces for Collective Defence and Crisis Response
 - lower readiness forces for Collective Defence and Rotation
 - longer term build-up and augmentation

NATO Defence Planning

Logistics
Planning

CIS
Planning

Nuclear
Planning

Civ.
Emerg
Planning

Resource
s
Planning

Armament
Planning

Force
Planning

Principal Planning Disciplines

NATO Defence Planning

Logistics
Planning

CIS
Planning

Nuclear
Planning

Civ.
Emerg
Planning

Resource
s
Planning

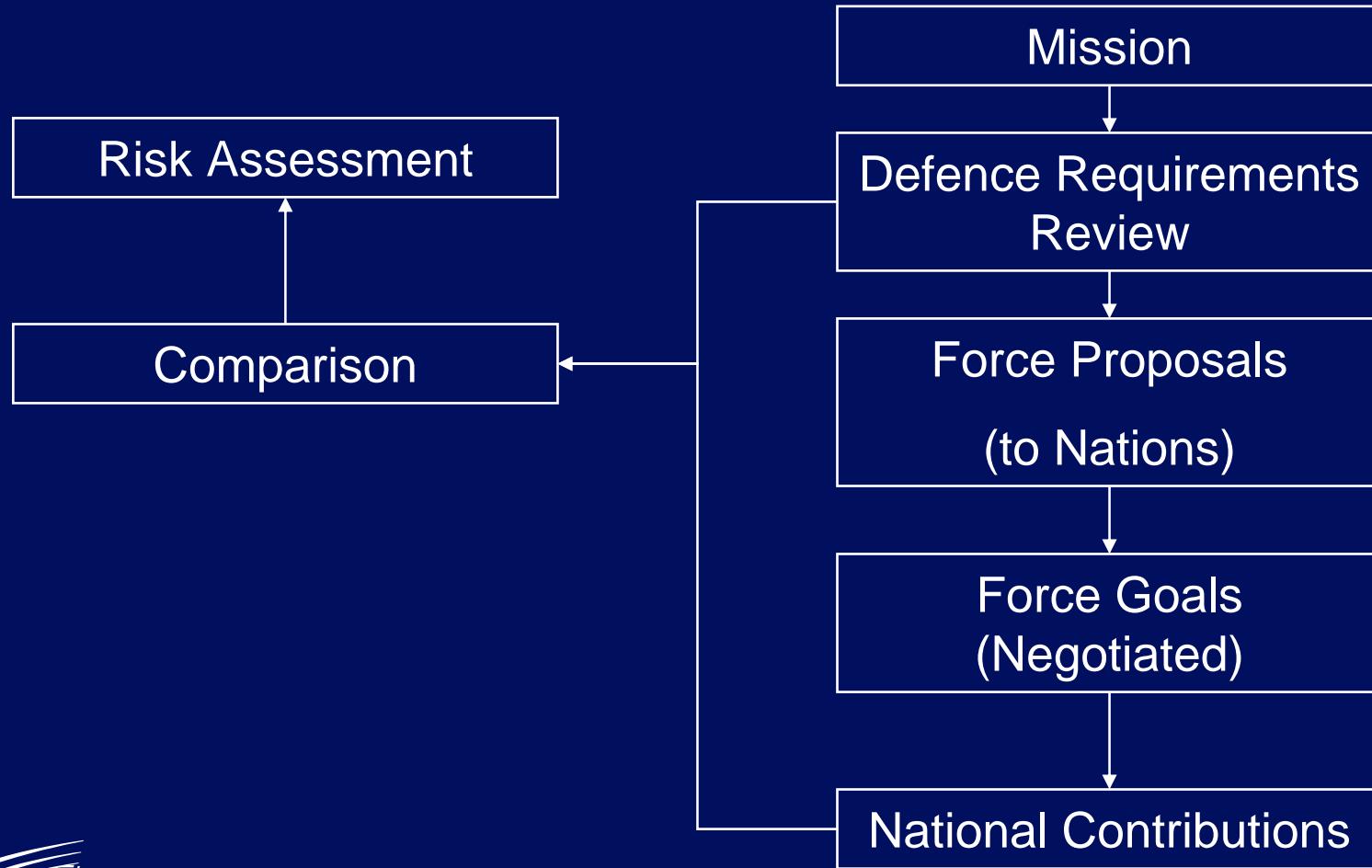
Armament
Planning

Force
Planning

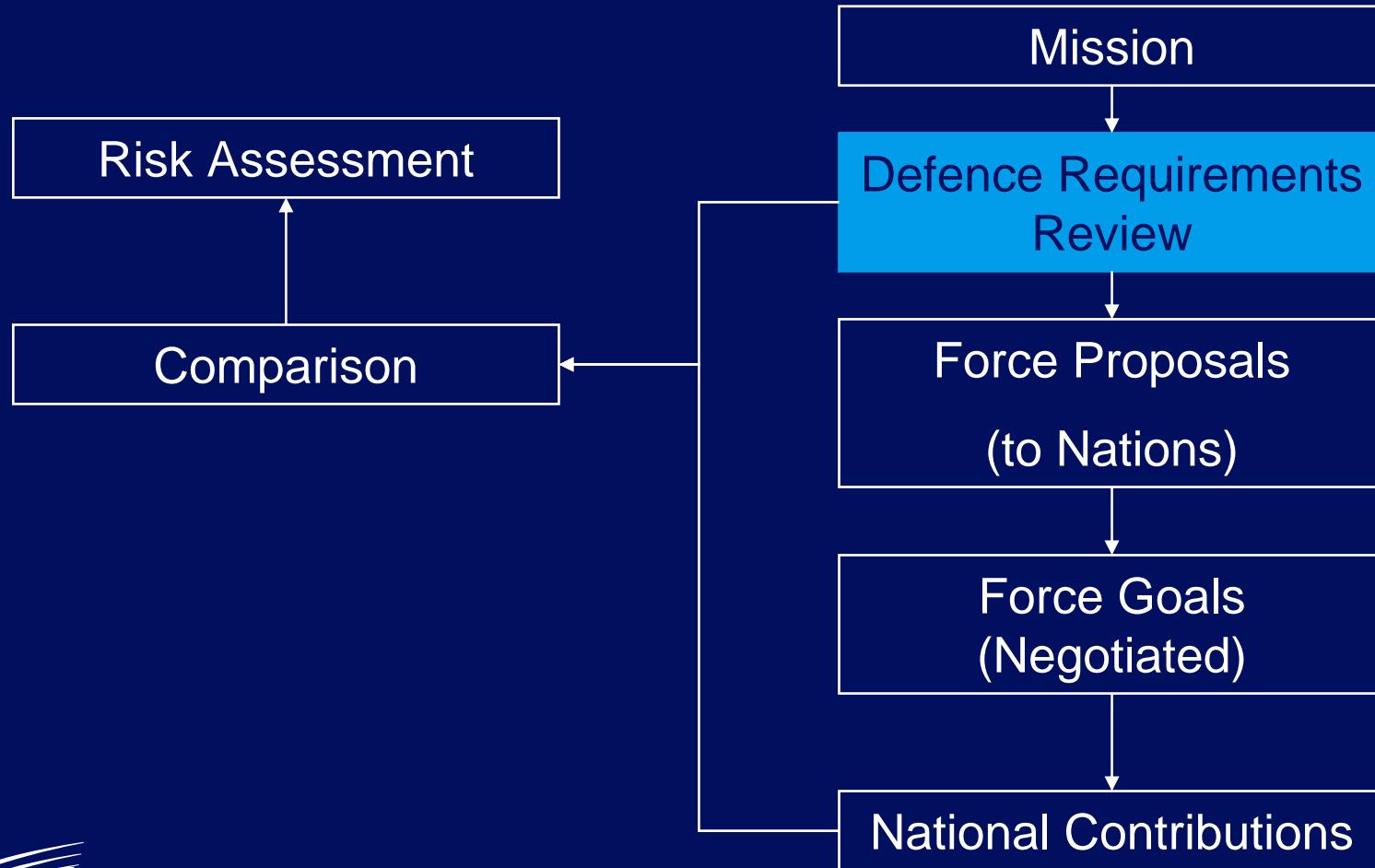
Principal Planning Disciplines

Force Planning

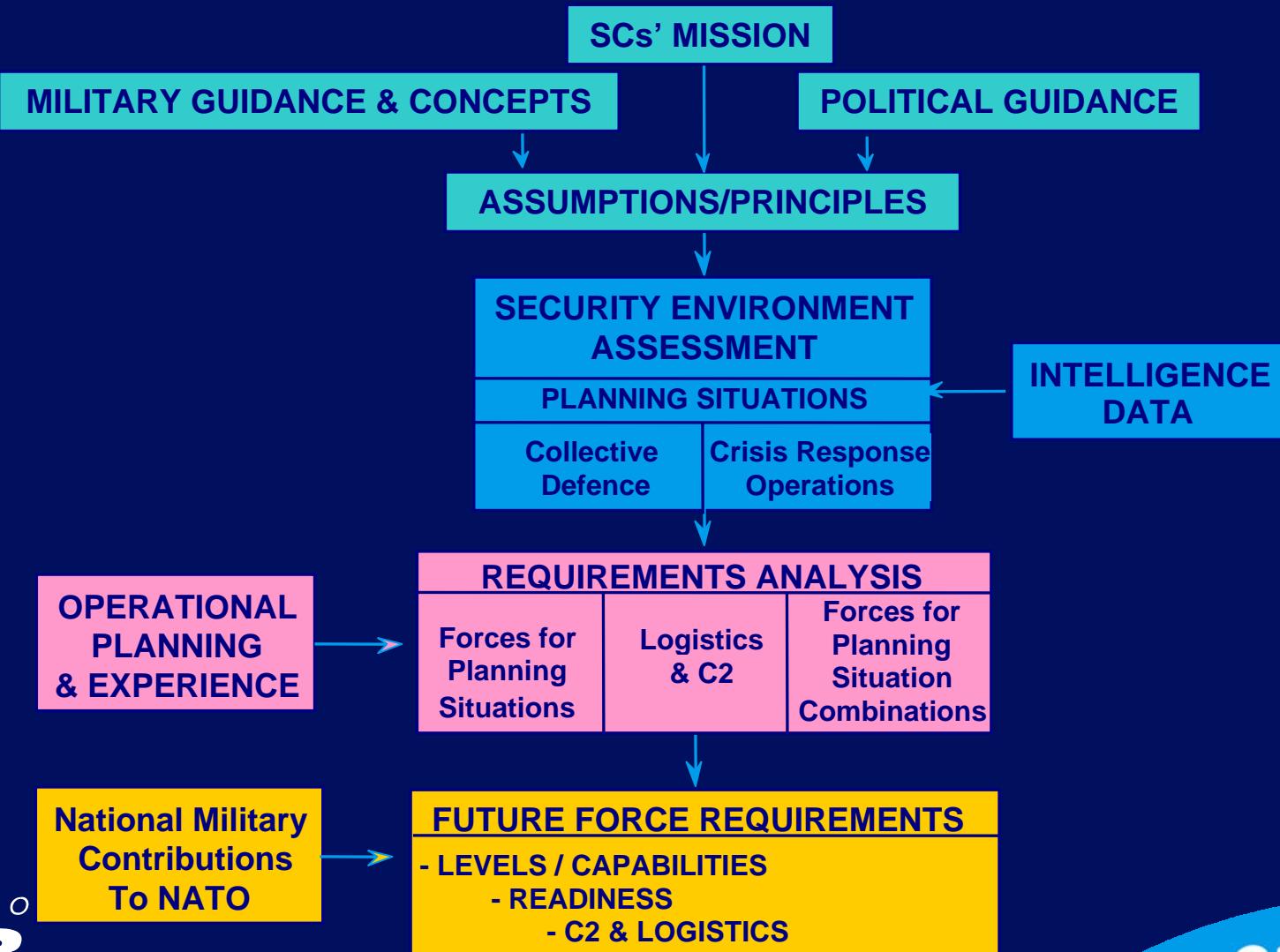
NATO Force Planning



NATO Force Planning



Defence Requirement Review



Mission Task Analysis

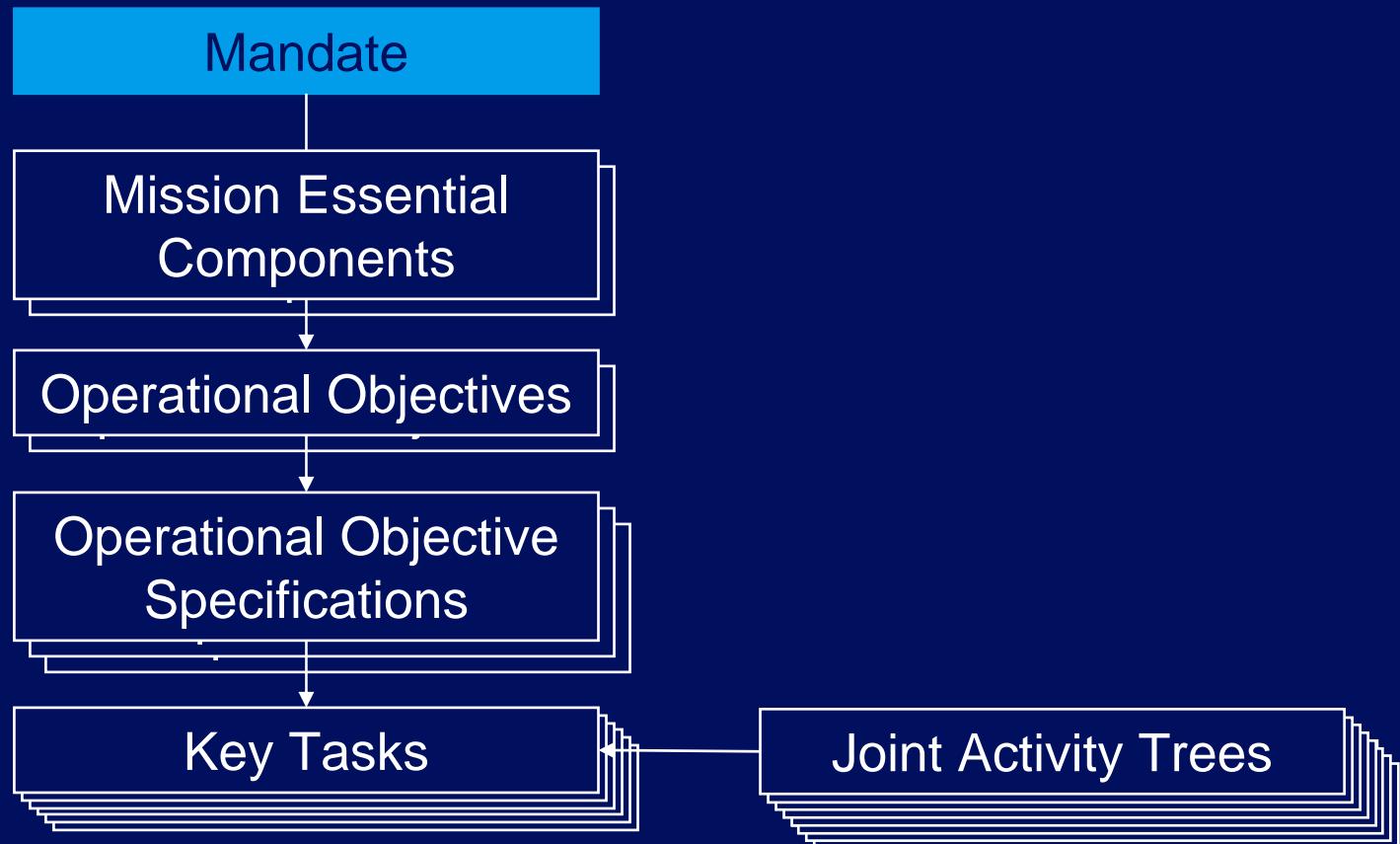
Mission Task Analysis

- Methodology originally developed by NC3A for analysis of Peace Support Operations.
- Peace Enforcement, Peace Support and Extraction scenarios worked up by George Mason University.
- QinetiQ evolved methodology for Article V operations.
- Based on a hierarchy where each level completely describes the mission.

Mission Task Analysis



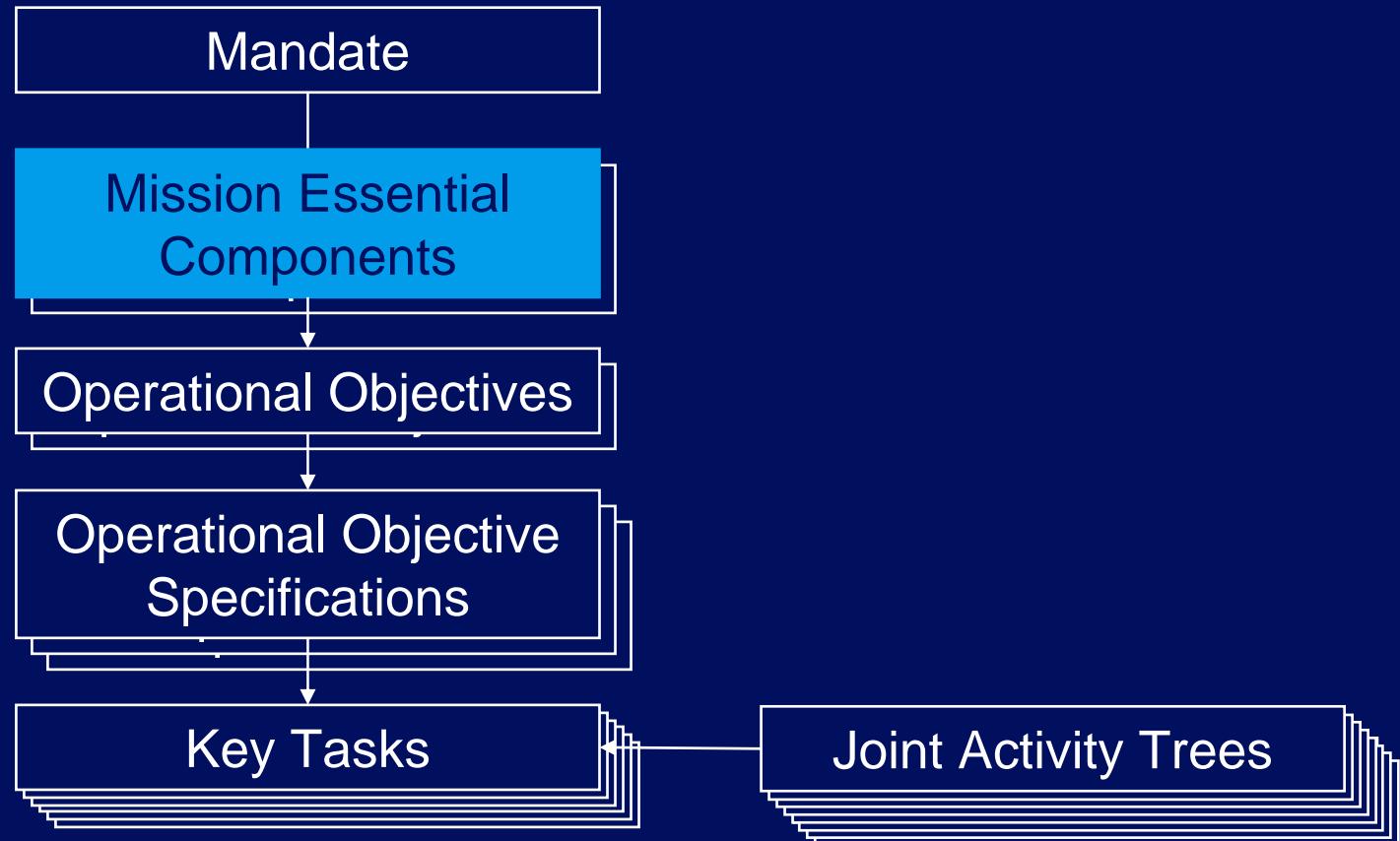
Mandate



Mandate

- The political purpose for the use of military force - also known as the “political mission”.
- Peace Enforcement to restore order:
 - “The force is to provide sufficient security within the region to allow political and diplomatic activity to occur which could lead to the establishment of a recognized civil authority”

Mission Essential Components



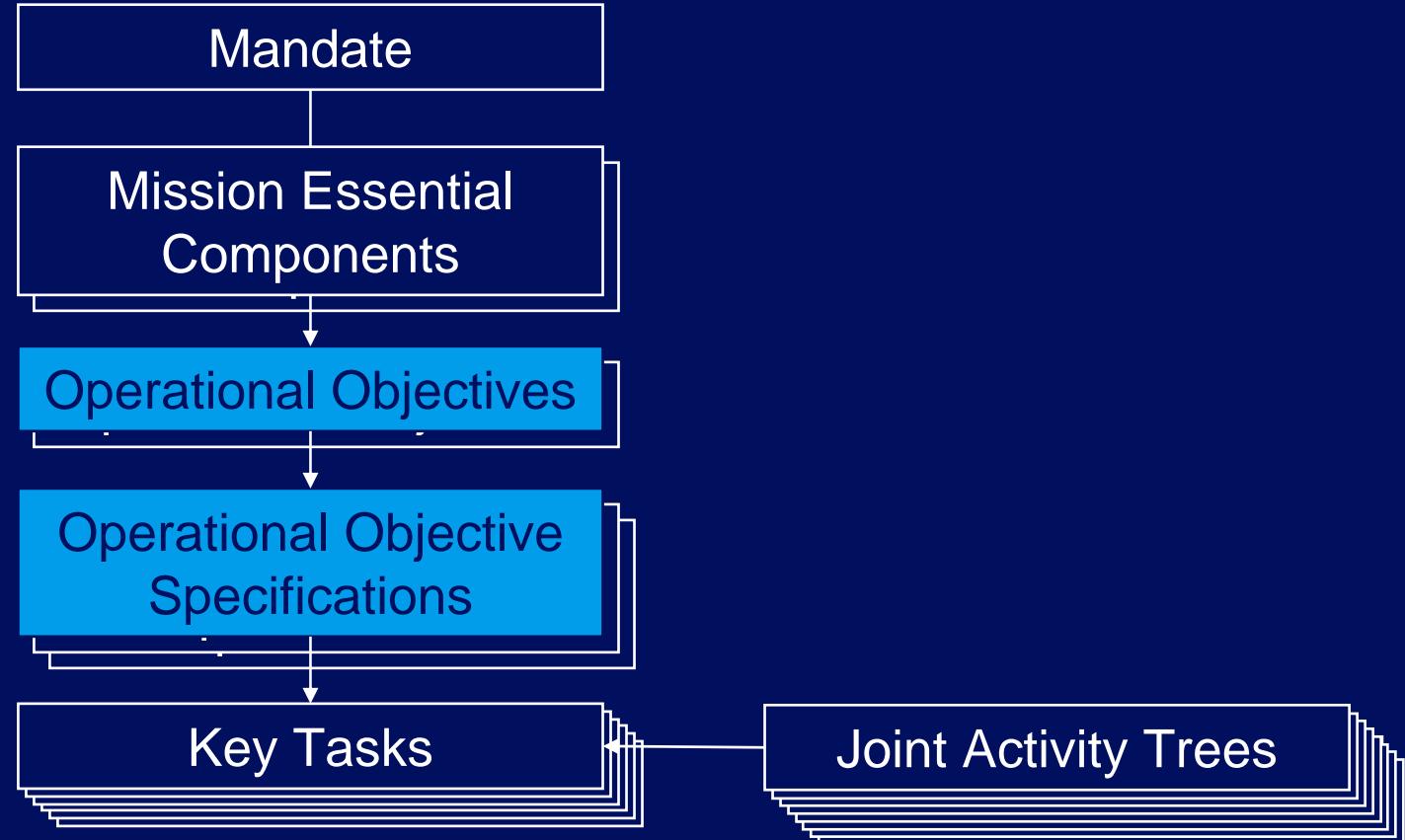
Mission Essential Components

- High level essential military tasks
 - what needs to be done
 - failure implies likely failure of the mission
 - not dependent upon chosen course of action
 - not time dependent
 - includes mandated and implied tasks
- **The MEC are the highest level complete set of required tasks**

Mission Essential Components

Mission:	PE 01	Peace enforcement to restore order		
Mandate	To provide sufficient security within the region to allow political and diplomatic activities to occur which could lead to the establishment of a recognised civil authority			
Mission Essential Components				
MEC ID	MEC Description			
▶ 1	Provide a secure environment by establishing the military dominance of the Peace Force			
2	Assure continued and uninterrupted provision of essential services and the protection of strategic national assets.			
3	Assist in the protection of civilian agencies in restoring the economic infrastructure and the provision of aid.			
4	Deter, and if necessary prevent, adverse external intervention.			
5	Ensure continued political support for the mission			
6	Conduct operations in accordance with the principles of PSO			
7	Provide standard military requirements			
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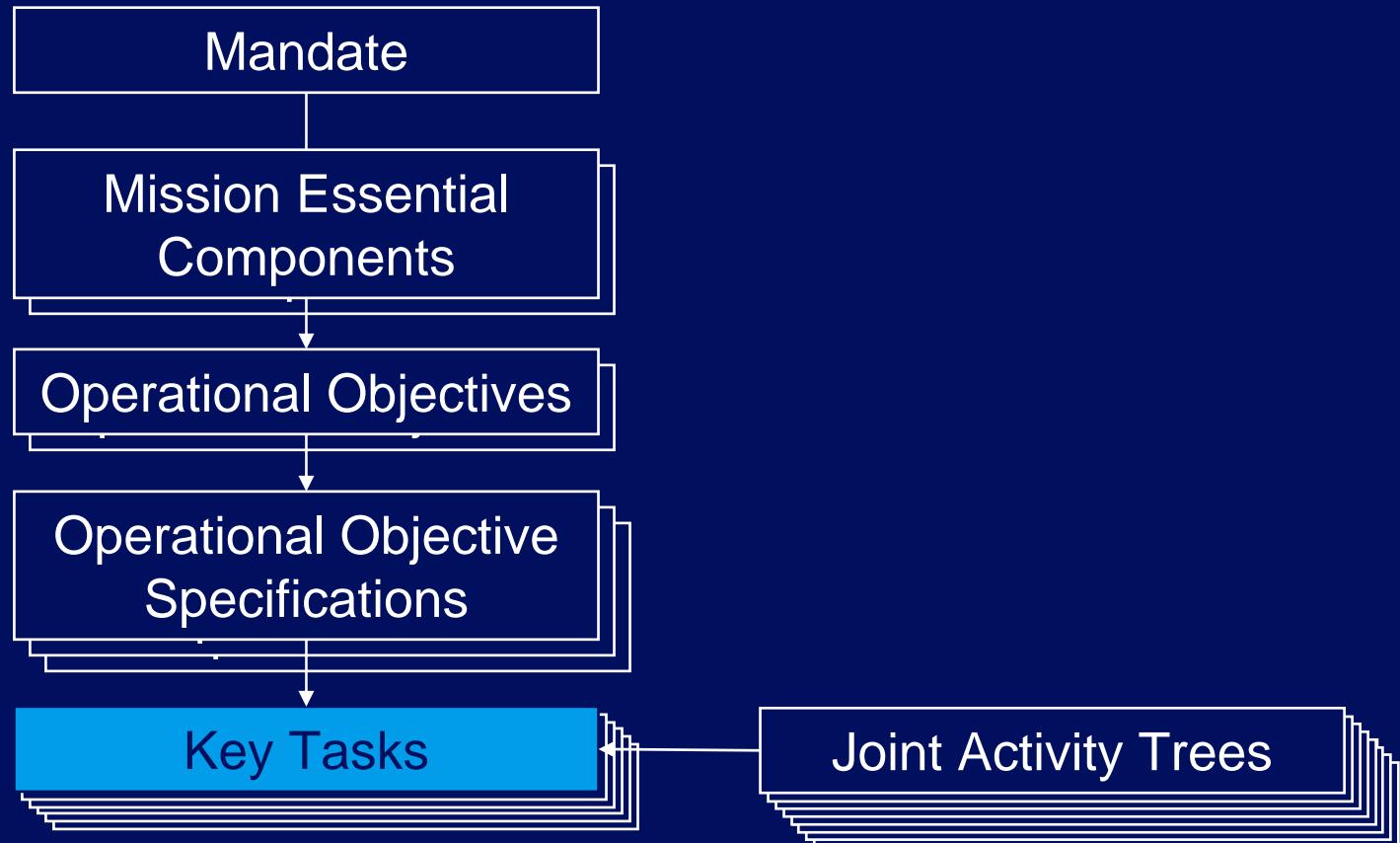
Operational Objectives & Specifications



Operational Objective & Specifications

- Course of action
 - how the MEC are to be achieved in time
 - implementation of MEC through a course of action
- Operational Objectives
 - time dependent \Rightarrow phasing
 - objectives can support more than one MEC
 - specifications allow amplification of an objective within a phase
- The Objectives are the highest temporal set of required tasks.

Key Tasks



Key Tasks

- Lowest level set of required tasks
 - non-service specific
 - allow a “visualisation” of a part of the mission
 - low level component of overall mission
 - each key task supports only one operational objective and specification
- Each Key Task represents a separate low-level problem

Objectives & Key Tasks

Operational Objective:	4	Conduct enabling operations for own force
Specification:	4.1	Ensure safe and timely arrival of forces
Key Tasks		
Key Task ID	Key Task Name	
4.1.1	Transport forces to theatre	
4.1.2	Gain control of theatre reception / transit centres	
► 4.1.3	Extend reception / transit centre capacities	
4.1.4	Operate theatre reception / transit centres	
4.1.5	Ensure security of reception / transit centres	
*		

Record:   3    * of 5  

Joint Activity Trees

- Components
 - A “tree” description of low level tasks / activities
 - Force Allocation Rules
 - logic for associating forces to JAT task requirements
 - timing sequence for sequential activities
 - Links to supporting JAT
 - Each JAT can reference other “supporting” JAT
 - Key assumptions
 - environmental validity or suitability of JAT

Joint Activity Trees

JAT Root:	OP 1206	Gain control of reception / transit centres
Constraint:	Assumed that landings within the crisis area will only be potentially lightly opposed (semi-permissive environment). However, larger incidents could develop following the landing. Potential threat forces have degraded C2, logistics, etc.	
Key Task:	4.1.2	Gain control of theatre reception / transit centres
Joint Activity Tree Components		
<ul style="list-style-type: none">□... Gain control of reception / transit centres<ul style="list-style-type: none">□... Conduct an amphibious entry within the crisis area<ul style="list-style-type: none">+... Establish amphibious objective area (AOA)+... Provide secure approaches to the landing areas+... Secure landing zones<ul style="list-style-type: none">... Secure reception / transit centres+... Provide firepower support<ul style="list-style-type: none">... Provide combat engineering support... Provide over-the-shore logistical support+... Provide movement control within the AOA+... Conduct an airborne entry within the crisis area+... Establish access rights to reception / transit centres<ul style="list-style-type: none">... Provide a deterrent force against major incidents near reception / transit centres□... Support entry forces<ul style="list-style-type: none">+... Provide command and control+... Provide logistical support+... Ensure force protection+... Provide intelligence+... Provide additional fire power support		

Force Allocation Rules

JAT	OP 1206	Gain control of reception / transit centres
Force Allocation Rule		<p>Entry area = suitable APOD + SPOD + Assembly area in close proximity Entry designated as amphibious or airborne - generally only first entry area is designated amphibious</p> <p>Requirements - Amphibious Entry / per entry area Surveillance Taskings - ASW area, ASW barrier, AGSR of entry area, Weather conditions, Manoeuvre forces - 2 marine infantry battalions, 2 tank platoons Firepower support - minimum of 1 artillery battery / battalion, 1 CAP (2 a/c) [DCP of force = DCP of potential threat] Military Engineering support - normal combat support level</p>
Input		<p>Location of entry area Potential threats in vicinity Selection of amphibious / airborne Day by which entry area is to be secured</p>
Output		<p>Manoeuvre and combat support forces Surveillance taskings Force protection taskings</p>
Timing		<p>D-Day (entry of airborne or amphibious forces) = day entry area to be secured - 5 days MCM clearance for amphibious landing area by D-Day ASW area surveillance completed before MCM clearance commences</p>
Tools		<p>None</p>
Notes		<p>Assumptions: APOD, SPOD, assembly areas and lines of communication have suffered minimal damage.</p>

Mission Task Analysis

Article V Operations

Mandate

- “Establish sufficient military forces, within the theatre of operations, to prevent sustained violation of NATO territorial integrity. Prevention should take the form of deterrence, defence and, if necessary, restoration operations [but at the minimum cost and risk to NATO].”

Mission Essential Components

- Prevent Violation of NATO territorial integrity.
- Maintain Alliance solidarity & cohesion.
- Standard Military Requirements.

Operational Objectives & Specifications

- Prevent Violation of NATO territorial integrity
 - Conduct Deterrence Operations
 - Show of Force
 - Defend Vital Locations
 - Enforce Sanctions
 - Provide a Defensive Deterrence
 - Conduct Defensive Operations
 - Conduct Restoration Operations

Key Tasks

- Prevent Violation of NATO territorial integrity
 - Conduct Deterrence Operations
 - Provide a Defensive Deterrence
 - Provide a Deterrent force for threats
 - Deter interference from third parties

Conclusion

Conclusion

- The mission task analysis approach provides a consistent approach for the decomposition of complex military missions.
- Approach is applicable to all military missions
 - Including PSO and Article V
- Provides detailed descriptions of each planning situation
 - basis for determining requirements
 - self-documentation of planning situations
 - “scenario framework” for supporting other work

Conclusion

- Approach successfully applied to:
 - Peace Enforcement
 - Conflict Prevention
 - Extraction
 - Peace Keeping
 - Article V